

GLOBE AT A GLANCE

The Graph500 top 11 supercomputers

The Graph500 list ranks supercomputers based on their ability to handle data-intensive loads, also known as Big Data. While the TOP500 list also ranks supercomputers, it ranks them by measuring how fast they can solve linear equations—a good metric for evaluating how a computer system will perform traditional modeling and simulation tasks. But computer scientists are increasingly using supercomputers to analyze massive data sets, and the Graph500 list ranks computer systems using a benchmark that addresses this specific task.



JUQUEEN

Specs: IBM BlueGene/Q, Power BQC

16C 1.6 GHz

Country: Germany

Site: Forschungszentrum Juelich

No. of Nodes: 16,384
No. of Cores: 262,144
Problem Scale: 38
GTEPS: 5,848

Specs: National University of Defense Technology - MPP

Country: China
Site: Changsha, China

No. of Nodes: 8,192

No. of Cores: 196,608

Problem Scale: 36

GTEPS: 2,061.48

Fermi

Specs: IBM BlueGene/Q, Power BQC

16C 1.6 GHz

Country: Italy

Site: Cineca

No. of Nodes: 8,192

No. of Cores: 131,072

Problem Scale: 37

GTEPS: 2,567

K computer

Specs: Fujitsu custom supercomputer

Country: Japan

Site: RIKEN Advanced Institute for

Computational Science

No. of Nodes: 65,536

No. of Cores: 524,288

Problem Scale: 40

GTEPS: 17,977.1

Avoca

Specs: IBM BlueGene/Q, Power BQC

16C 1.6 GHz

Country: Australia

Site: Victorian Life Sciences

Computation Initiative

No. of Nodes: 4,096

No. of Cores: 65,536

Problem Scale: 36

GTEPS: 1,427

For the benchmark, each supercomputer is given a massive set of data to crunch, called a graph. A graph consists of several interconnected sets of data, with vertices and edges, similar to what a map of your Facebook network might look like. A user would represent a vertex, while the connection between two users would represent an edge. Starting with one vertex, a supercomputer is charged with discovering all other vertices in the graph by following each edge. The speed with which a supercomputer accomplishes this task, measured in gigateps (GTEPS), or billions of traversed edges per second, determines how high it ranks on the Graph500 list. The following ranking is from June 2014; the list in its entirety is available at www.graph500.org.